

1. A toy comprising:
a body;
a wheel region that rotates about a wheel axis, the wheel region being coupled to the
body;

5 a back region coupled to the body; and
an actuation system within the body and coupled to the back region to oscillate the
back region about a back axis perpendicular to the wheel axis as the wheel region rotates.

2. The toy of claim 1 further comprising:
10 a drive wheel region that rotates about a drive wheel axis that is parallel to the wheel
axis and causes the body to move in a direction perpendicular to the drive wheel axis.

3. The toy of claim 1 further comprising:
a drive wheel region attached to the body to rotate about a drive wheel axis;
15 a motor; and
a second actuating system coupled to the motor and to the drive wheel region to move
the body in a direction that is perpendicular to the drive wheel axis.

4. The toy of claim 3 wherein motion of the body causes the wheel region to
20 rotate about the wheel axis.

5. The toy of claim 1 wherein the back region comprises a crank attached to a
lower surface of the back region and coupled to the actuation system to oscillate the back
region as the wheel region rotates.

25 6. The toy of claim 5 wherein the actuation system comprises:
a crank device attached to the crank;
a coupling device attached to the crank device; and
a wheel device attached to the coupling device and to the wheel region.

30 7. The toy of claim 6 wherein:
the crank device includes a crank gear;

the coupling device includes a coupling gear; and
the wheel device includes a wheel gear.

8. The toy of claim 6 wherein:

5 the crank device includes a crank pulley;

the wheel device includes a wheel pulley; and

the coupling device includes a coupling belt that wraps around the crank pulley and
the wheel pulley.

10 9. The toy of claim 6 wherein the wheel device is fixed to an axle of the wheel
region.

10. The toy of claim 1 further comprising:

a side panel external to and attached to the body; and

15 an actuating device coupled to the wheel region and to the side panel to oscillate the
side panel about a side panel axis that is parallel to the wheel axis as the wheel region rotates.

11. The toy of claim 10 wherein the actuating device includes a protrusion on the
side panel that engages a cam on the wheel region.

20 12. The toy of claim 1 further comprising a tail connected to the back region to
oscillate as the back region oscillates.

13. The toy of claim 12 wherein the body is shaped like the body of an animal and
25 the oscillation of the back region and the tail is consistent a wagging movement of the tail of
the animal.

14. The toy of claim 1 wherein the back region includes:

a back panel; and

30 cylindrical projections that extend from side surfaces of the back panel;

wherein the cylindrical projections are shaped to fit within cavities of the body.

15. The toy of claim 14 wherein the back axis is defined by the cylindrical projections.

16. The toy of claim 1 further comprising a motor that causes the toy to move in a forward direction and a backward direction, both directions being perpendicular to the wheel axis.

17. The toy of claim 16 further comprising:
a pendulum rotatably attached to an inside surface of the body and free to oscillate about an axis that is perpendicular to the direction in which the toy moves, and
a pivoting member coupled to the pendulum and to a cavity of the body, the pivoting member being free to oscillate about a pivot within the cavity.

18. The toy of claim 17 wherein the pendulum oscillates in response to successive movements of the toy in the forward and backward directions.

19. The toy of claim 18 wherein the pivoting member oscillates about the pivot in response to oscillation of the pendulum.

20. The toy of claim 17 wherein at least a portion of the pivoting member is external to the body.

21. The toy of claim 19 further comprising an output device within the body, wherein the controller causes the output device to output a signal when the pivoting member oscillates.

22. The toy of claim 1 further comprising a flexible skin surrounding the body.

23. The toy of claim 1 wherein the body is in the shape of an animal.

24. The toy of claim 23 wherein the body is in the shape of a cat or a dog.

25. A toy comprising:

a body;

a controller within the body;

a head region coupled to the body and including:

5 an elongated neck device, and

a head attached to the elongated neck device;

an actuation system coupled to the head region; and

a motor within the body, coupled to the controller and to the actuation system to
activate the actuation system in response to a signal from the controller;

10 wherein, when activated, the actuation system rotates the elongated neck device about
a neck axis, rotates the head about a head axis, and rotates the head about a tilt axis that is
different from the head axis in response to a signal from the controller.

26. The toy of claim 25 wherein the actuation system includes first and second
15 elongated devices that connect at one end to a pulley coupled to the motor and at another end
to a lever within the head region.

27. The toy of claim 26 wherein the first and second elongated devices extend
from the pulley along sides of the elongated neck device, and to the lever.

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28. The toy of claim 26 wherein the elongated neck device includes:

a first end that couples to a post attached to the body, and

a second end that couples to the lever.

29. The toy of claim 28 wherein the first end of the elongated neck device defines
25 the neck axis and the second end of the elongated neck device defines the head axis.

30. The toy of claim 26 wherein the actuation system includes a pivot device that
is attached to the lever and the elongated neck device at the second end of the elongated neck
30 device.

31. The toy of claim 30 wherein the pivot device includes a post that defines the tilt axis.

32. The toy of claim 25 further comprising a flexible skin surrounding the body.

33. The toy of claim 25 wherein the body is in the shape of an animal.

34. The toy of claim 33 wherein the body is in the shape of a cat or a dog.

35. A method of moving a toy, the method comprising:
rotating an elongated neck device attached to a body of the toy about a neck axis;
rotating a head attached to the elongated neck device about a head axis; and
rotating the head about a tilt axis that is different from the head axis;
wherein all rotations are performed by a motor within the toy body and in response to
a signal from a controller within the toy body.

36. A method of moving a toy, the method comprising:
rotating a wheel attached to a body of the toy about a wheel axis to cause the body of
the toy to move; and

pivoting a first portion of the body relative to a second portion of the body about a
pivoting axis that is perpendicular to the wheel axis while the body of the toy moves in a
direction perpendicular to the wheel axis and the pivoting axis due to rotation of the wheel.

37. The method of claim 36 further comprising determining the position of the
first body portion relative to the second body portion.

38. The method of claim 37 wherein pivoting the first body portion relative to the
second body portion is based on the determined position.

39. The method of claim 36 further comprising:

oscillating a pendulum rotatably attached to an inside surface of the body about an axis that is perpendicular to the direction in which the toy moves in response to successive movements of the toy in a forward and backward direction, and

5 oscillating a pivoting member coupled to the pendulum and to a cavity of the body in response to oscillation of the pendulum.

40. The method of claim 39 further comprising outputting a signal to an output device within the body when the pivoting member is oscillating.

10 41. A toy comprising:

a body including a first body portion and a second body portion;

a wheel attached to the body of the toy and able to rotate about a wheel axis to cause the body of the toy to move in a direction perpendicular to the wheel axis; and

15 an actuation system within the body that causes the first body portion to rotate relative to the second body portion about a pivoting axis that is perpendicular to the wheel axis and the direction of motion of the toy.

42. The toy of claim 41 wherein:

20 the first body portion houses a wiper contact that includes electrically-conductive paths, and

the second body portion houses a set of conductive wipers that protrude from a surface of the second body portion and contact the electrically-conductive paths.

25 43 The toy of claim 42 further comprising a controller coupled to the electrically-conductive paths to determine a location of the first body portion relative to the second body portion.

30 44. The toy of claim 43 further comprising a sensory region on the body of the toy and coupled to the controller, wherein the controller is coupled to the actuation system to activate the actuation system upon receiving input from the sensory region.

45. The toy of claim 44 wherein the sensory region includes a microphone and the controller activates the actuation system in response to input from the sensory region that indicates a sound has been detected.

5 46. The toy of claim 41 further comprising a head region attached to the first body portion, wherein the actuation system animates the head region after causing the first body portion to rotate relative to the second body portion.

10 47. The toy of claim 41 further comprising:
a pendulum rotatably attached to an inside surface of the body and free to oscillate about an axis that is perpendicular to the direction in which the toy moves, and
a pivoting member coupled to the pendulum and to a cavity of the body, the pivoting member being free to oscillate about a pivot within the cavity.

15 48. The toy of claim 47 wherein the pendulum oscillates in response to successive movements of the toy in forward and backward directions.

20 49. The toy of claim 48 wherein the pivoting member oscillates about the pivot in response to oscillation of the pendulum.

50. The toy of claim 48 further comprising an output device within the body that outputs a signal when the pivoting member oscillates.

25 51. The toy of claim 50 wherein the body is in the shape of an animal and the pivoting member is in the shape of a tongue of the animal such that oscillation of the pivoting member resembles a panting motion and the output device outputs a panting sound during the panting motion.

30 52. A toy comprising:
a body including a first body portion and a second body portion;
a controller within the body;
a motor within the body and coupled to the controller;

a steering system coupled to the motor and to the body and configured to rotate the first body portion relative to the second body portion;

a head region coupled to the body; and

an actuation system coupled to the motor and the head region;

5 wherein the motor is configured to actuate the steering system to cause the first body portion to rotate relative to the second body portion and to cause the actuation system to animate the head region simultaneously with the relative motion between the first and second body portions when the controller receives a sensed condition.

10 53. The toy of claim 52 further comprising:

a wheel region attached to the body to rotate about a wheel axis;

a second motor within the body, and

a second actuating system coupled to the second motor and to the wheel region to move the body in a direction that is perpendicular to the wheel axis.

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54. The toy of claim 53 further comprising a wheel region defining a wheel axis and coupled to the motor to move the toy in a forward direction and a backward direction, both directions being perpendicular to the wheel axis.

20 55. The toy of claim 54, further comprising:

a pendulum rotatably attached to an inside surface of the head region and free to oscillate about an axis that is perpendicular to the direction in which the toy moves, and

a pivoting member coupled to the pendulum and to a cavity of the head region, the pivoting member being free to oscillate about a pivot within the cavity.

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56. The toy of claim 55 wherein the pendulum oscillates in response to successive movements of the toy in the forward and backward directions.

57. The toy of claim 56 wherein the pivoting member oscillates about the pivot in response to oscillation of the pendulum.

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58. The toy of claim 57 wherein at least a portion of the pivoting member is external to the head region.

59. The toy of claim 57 further comprising an output device within the body,
5 wherein the controller causes the output device to output a signal when the pivoting member oscillates.

60. The toy of claim 53 wherein the actuation system comprises first and second elongated devices that connect at one end to a pulley coupled to the motor and at another end
10 to a lever within the head region.

61. The toy of claim 60 wherein the first and second elongated devices extend from the pulley along sides of the elongated neck device, and to the lever.

62. The toy of claim 60 wherein the elongated neck device includes:
15 a first end that couples to a post attached to the body, and
a second end that couples to the lever.

63. The toy of claim 62 wherein the first end of the elongated neck device defines
20 the neck axis and the second end of the elongated neck device defines the head axis.

64. The toy of claim 63 wherein the actuation system animates the head region by rotating the elongated neck device about a neck axis, rotating the head region about a head axis, and rotating the head region about a tilt axis that is different from the head axis in
25 response to a signal from the controller.

65. The toy of claim 64 wherein the actuation system includes a pivot device that is attached to the lever and to the elongated neck device at the second end of the elongated neck device.

66. The toy of claim 65 wherein the pivot device includes a post that defines the tilt axis.

67. The toy of claim 64 wherein the steering system causes the first body portion to rotate in a direction relative to the second body portion.

5 68. The toy of claim 64 wherein the actuation system rotates the elongated neck device about the neck axis in a direction that is equivalent to the direction that the first body portion rotates relative to the second body portion.

10 69. The toy of claim 64 wherein the actuation system rotates the elongated neck device about the head axis in a direction that is equivalent to the direction that the first body portion rotates relative to the second body portion.

70. The toy of claim 53 wherein the steering system comprises:
a steering bar fixed within the first body portion,
15 a hinge device fixed within the second body portion, and
linkages that couple the steering bar to the hinge device.

20 71. The toy of claim 70 wherein actuation of the steering system includes rotating the steering bar to cause the linkages to move so as to cause the first body portion to move relative to the second body portion.

72. The toy of claim 52 further comprising a flexible skin surrounding the body.

25 73. The toy of claim 52 wherein the body is in the shape of an animal.

74. The toy of claim 52 wherein the body is in the shape of a cat or a dog.

75. A toy comprising:
a body including a first body portion and a second body portion;
30 a sensory region on the body;
a controller within the body, the controller receiving input from the sensory region on the body;

a motor within the body and coupled to the controller; and

an actuating system coupled to the motor and to the first and second body portions to move the first body portion relative to the second body portion when the controller receives input from the sensory region;

5 wherein the actuating system moves the first body portion relative to the second body portion in a direction that is based on the location of the sensory region on the body.

76. The toy of claim 75 in which the sensory region includes a touch-sensitive device.

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77. The toy of claim 76 in which the touch-sensitive device includes a capacitively-coupled device or an inductively-coupled device.

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78. The toy of claim 75 in which the sensory region includes a pressure-activated switch.

79. The toy of claim 75 in which the sensory region includes a light-sensing device.

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80. The toy of claim 75 in which the sensory region includes a sound-sensing device.

81. The toy of claim 75 in which the actuating system moves the first body portion relative to the second body portion in a direction towards the sensory region.

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82. The toy of claim 75 in which the actuating system moves the first body portion relative to the second body portion in a direction away from the sensory region.

83. The toy of claim 75 wherein the actuating system moves the first body portion relative to the second body portion by pivoting the first body portion relative to the second body portion about a pivot axis.

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84. The toy of claim 83 wherein the pivot axis intersects the first and second body portions.

85. The toy of claim 75 further comprising:
5 a wheel region attached to the body to rotate about a wheel axis;
a second motor within the body, and
a second actuating system coupled to the second motor and to the wheel region to move the body in a direction that is perpendicular to the wheel axis.

10 86. A toy animal comprising:
an internal assembly configured to resemble an animal, the internal assembly including a torso region, a rear region, a head region attached to the torso region, an arm region attached to the torso region, and a back region attached to the rear region;
a fur coat over the internal assembly;
15 a controller within the internal assembly;
an actuating system coupled to the internal assembly and to the controller to cause the toy to move forward and backward, to cause the torso region to pivot relative to the rear region, to animate the head region, to oscillate the arm region as the toy moves, and to oscillate the back region as the toy moves.

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